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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

REPORT OF THE MOUNTAIN PINE BEETLE INFESTATION IN THE LODGEPOLE STANDS OF CRATER LAKE NATIONAL PARK SEASON OF 1929

by

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Alturas, Calif.
September 8, 1929

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REPORT OF
THE MOUNTAIN PINE BEETLE INFESTATION
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OF CRATER LAKE NATIONAL PARK
SEASON OF 1929

A survey of the lodgepole pine stands of Crater Lake National Park was made by the writer from September 3 to 7, 1929, in order to outline plans for the continuation of the fight against the mountain pine beetle (Dendroctonus monticolae Hopk.). The Park Superintendent assigned Mr. Harkins to assist in this work. The object of the survey was to determine the results of the recent control work and to arrive at a decision as to future tactics in handling this pine beetle situation.

All the control areas were visited and strip counts made through them to determine the amount of reinfestation. A general extensive "red-top" survey was made of the rest of the Park area to determine the extent, location and approximate amount of new infestation in the uncontrolled areas.

History of Past Infestation

The widespread destruction of lodgepole stands in the vicinity of Crater Lake first received attention by the Park Superintendent and Forest officers in 1923. After a survey made by Mr. Patterson of the Bureau of Entomology it became evident that the destruction of these stands had been going on for some time, probably for fifteen years or more. The stands north of the Lake between it and Diamond Lake were already largely devastated, and the beetles were starting their activities in the stands south of the Lake. The infiltration of beetles continued in these stands during the subsequent years, and in 1928 Patterson reported 33,920 acres of dead forest, 7,100 acres of active and epidemic infestation and 15,360 acres uninfested.

THE PRESENT SITUATION

At this time all the remaining stands of lodgepole in the Park can be considered as infested, with two or three highly epidemic centers in units not covered by the recent control work.

On the areas treated by the spring control of 1929 only a nominal reinfestation has occurred, representing perhaps twenty per cent as much as was on the ground before the control work. To obtain control, however, these areas should be recleaned.

In the stands outside of the control units the infestation is for the most part light but widespread. Any attempt to eliminate the beetles would require that this large area of low-intensity infestation over approximately 25,000 acres of patchy lodgepole forest be considered in control work. This would be both expensive and of doubtful benefit in obtaining the desired result.

The only heavy concentration of beetles in the southern part of the Park was found on the plateau between the Middle and East Forks of Anna Creek. Here 4,000 trees had to be be abandoned at the close of the spring control work, and from these fully 6,000 newly-infested trees have developed.

In the western part of the Park another concentration of new infestation exists between Castle and Little Castle Creeks. This joins the extensive killings to the north.

The Situation by Units

Sand Creek-East Entrance Unit

This unit has been treated almost continuously since 1925. The Park Service has covered the portion within the Park boundary, and the Forest Service the adjacent infested National Forest lands. The unit at present is in very good condition, but a light infestation is present throughout the unit, and an epidemic center east of Mt. Scott is gradually working around into the area. Continued protection of this unit is recommended.

Sun Creek Unit

A fire in 1923 swept through this area and greatly thinned the lodgepole stand. No control work has been done here, only a light infestation exists, and no control seems necessary. On account of the scattered character of the remaining stand, it is doubtful if this unit will support an epidemic infestation.

Middle Fork-East Fork Anna Creek Plateau

This is the unit where a highly epidemic infestation was discovered near the end of the 1929 treating work. About 6,000 trees were treated in this area and 4,000 trees left, as the beetles started flying before the work could be finished. At present these beetles have reinfested about 6,000 new trees, and the stand will soon be completely killed. This is a very inaccessible unit, and it is recommended that it be abandoned to the beetles.

Munson Creek-Middle Fork Anna Creek Plateau

The lodgepole pine on this plateau is already nearly 90 per cent killed, and there is very little new infestation in the unit. No further control work need be considered here.

Munson Valley Unit

Considerable control work has been done in this unit, and the lodgepole stand is largely depleted. Strip counts showed a small amount of reinfestation. Since the road to the Rim runs along the edge of this unit, it is recommended that the beetle protection work be continued.

Pumice Flat Unit

West of the Anna Spring-Klamath Falls road is an area of about 2,000 acres of lodgepole which has previously been reported as clean. A fire ran through the area about twenty years ago, and half of it is stocked with a very young stand of lodgepole pine, which is not subject to attack by the beetles. The remaining stand was found to have a few centers of infestation, and this unit will probably be considerably thinned before the infestation has run its course. Since the area is inaccessible, it is recommended that no control work be attempted in it.

Anna Spring Unit

The areas of pure lodgepole around Anna Spring Ranger Station are quite clean, since 2,711 trees were treated in the spring of 1929. Probably 500 infested trees would represent the reinfestation in this unit. This is a valuable and important area; its protection is fully justified and should be continued.

Whitehorse Unit

The stand in the upper end of this unit has been about fifty per cent killed, and a fairly heavy reinfestation was found following the spring control work. On the Medford road most of the lodgepole stand is fairly young and not susceptible to beetle attack, but parts of this unit are apt to be infested in the near future, as there is a very heavy epidemic on the areas across Castle Creek. This is a very hazardous fire area, and beetle control along the Medford road should be provided for as long as the danger of infestation exists.

Castle Creek Unit

The lodgepole stands in this unit are a mess. At the upper end of the drainage from fifty to seventy per cent of the stand has been killed, and a very active epidemic now exists between Castle and Little Castle Creeks. While this area was viewed only from a distance, there are probably from five to ten thousand infested trees in this area, while to the north, on the North Fork of Castle Creek, there is an active epidemic which is rapidly devastating the lodgepole stands in that drainage. These stands are now so far gone that any attempt to save them would be a difficult, if not altogether impossible task. No control work is recommended.

Taken as a whole, the remaining lodgepole stands to the west, south and east of Crater Lake are all infested to a greater or less extent, and the possibility of ending the beetle invasion through control work offers little hope. The most that can be expected with a reasonable outlay of money is to protect the more valuable recreational areas and the stands along the main roads, where the fire hazard is particularly high.

RESULTS OF PAST CONTROL WORK

Control work was started in the Park in the spring of 1925, when the infestation at the East Entrance, in Pinnacle Valley, Kerr Valley, Munson Valley and Anna Spring was treated. This work brought about a reduction of 70 per cent in the areas so treated; or in other words, an infestation of 4,291 trees was reduced to one of 1,389 trees. Subsequent work in the spring of 1926 and 1927 brought about additional reductions, and the areas south of the lake were apparently in very good condition at the end of the 1927 season. They were still menaced, however, by the heavy epidemic which was still active north of the lake.

The Forest Service cooperated by cleaning up its adjoining infested stands in the vicinity of Sand Creek, and in the spring of 1927 treated 4,000 trees. This reduced the infestation to 1,257 trees, which were treated the next year.

There are three outstanding conclusions to be drawn from the control work that has been done so far:

1. The work has demonstrated that it is possible to reduce greatly the current loss from pine beetles on the areas actually treated;

2. Control work, in felling the dead trees, has greatly reduced the fire hazard in these lodgepole stands, where either living or dead the heavy growth of pine is a serious fire risk.

3. It is equally evident that control work has failed to exterminate the beetles in the Park, even on the areas intensively worked, and that the beetles have the ability to increase their activities whenever control work stops.

The control work, which has covered only a relatively small part of the infested Park areas, has been uniformly successful in reducing the losses; but it has been ineffective in halting the beetle invasion, and in face of the widespread epidemics in the surrounding country there is little hope that it can do more than currently prevent the building-up of epidemics on small highly-protected areas. If the more valuable stands are protected until the epidemic in the rest of the area has run its course, there is some hope that these stands may be saved.

THE OBJECT OF PINE BEETLE CONTROL WORK

It may be well to stop and consider just why the control of lodgepole infestations in the Park is desirable, and for what reasons expenditures can be justified. The more important reasons would seem to be

1. To protect lodgepole pines because of their value as park trees;
2. To preserve the aesthetic beauty of the Park;
3. To prevent the creation of a tremendous fire hazard, caused by an accumulation of dead trees with dry, inflammable foliage, and the possible complete destruction of large forest areas by fire.

Considering the first objective, that of protecting lodgepole pines because of their value as park trees, we realize at once that these pines are perhaps the least valuable of any tree as a permanent Park tree. These pines are the first to come in following fires and are the first step in the succession of tree species. They are short-lived, and when mature and killed by beetles there is usually an understory of fir and hemlock waiting to take their place. These make much more valuable forest cover than the pines, and where this succession of types is taking place the elimination of the pine should be encouraged rather than prevented. In general, then, lodgepole is of only temporary value as a park tree, and it is questionable whether large sums should be spent for its protection on this basis.

From the standpoint of aesthetic value, there is considerable question as to how seriously dead trees damage the beauty of a landscape, especially when they form only one element in the stand. Many people feel that a sprinkling of red-top trees or white snags adds a touch of interest to the scene and relieves the monotony of a solid green forest. Control of pine beetles can hardly be justified from an aesthetic standpoint, as a jungle of felled trees and peeled stumps is much less beautiful than dying or dead snags.

It is the opinion of the writer that pine beetle control in this park can be justified only from the standpoint of reducing the fire hazard. To what extent it is profitable to treat beetle-killed trees because of the fire hazard that they create is very difficult to say. Without question dead trees with dry foliage are more inflammable and throw sparks farther than do green trees. However, air humidity is of even greater importance, and when this is low it makes very little difference whether the material is living or dead, a crown fire will be of nearly equal seriousness. If fire control is the main objective, rather than spend vast sums in controlling the beetles, it would seem a wiser policy to let the lodgepole die and spend some of this money on increasing fire protection forces during the period of greatest risk and until the pine had been replaced by more desirable species. However, considerable good could be accomplished in reducing beetle losses along the main traveled roads, where there is the greatest risk of fires starting.

FUTURE CONTROL PLANS

As was pointed out by Mr. Patterson in his report of last year (December 1928), there are three courses of action open in the management of the lodgepole forests within the Park in respect to control of mountain pine beetles. These are:

Plan 1. Intensive control work on all the areas infested at the present time, with the idea of eliminating the beetles from the Park areas and saving the remaining lodgepole forests.

To stand a reasonable chance of succeeding, this plan would have to take into account all the adjacent infestation within a radius of twenty-five or thirty miles (since it has been established beyond a reasonable doubt that these beetles may travel for such distances). This would involve the tremendous infestations north of the Lake on the Deschutes and Umpqua National Forests and require the cooperation of the Forest Service in controlling all such infestations in the general vicinity, while within the Park boundaries alone 25,000 to 30,000 acres of lodgepole would have to be combed carefully for infestations and all infested trees treated. To attempt this would require an expenditure of at least $25,000 of Park funds for the fiscal year 1930 and at least half this amount for several years to come. The plan would represent a commendable effort on the part of the Park Service to preserve the lodgepole forests but is doomed to defeat; for it is impossible to eliminate the beetles from such a large area, and sooner or later these stands are due to die and be replaced by other types. The plan is not only futile but would be tremendously expensive.

Plan 2. Control only along the roads in areas of high fire hazard and on recreational areas.

This plan would confine the work to areas on which most of the previous control work has been done, and would mean recleaning these areas for several years until the peak of the present epidemic has passed. It could be carried out with mimimum expense and without involving the cooperation of adjacent owners. It would serve the purpose of reducing the fire hazard in areas of high risk and avoid unsightly dead forest areas along the main traveled roads. This plan could be carried out for the fiscal year 1930 with an expenditure of not over $5,000 and about half this amount for the next three or four years.

Plan 3. To do no control work.

If this course is followed the epidemic will soon die out for lack of suitable host material, as another three or four years will see the end of the present mature lodgepole stands in the Park. While this is the cheapest and easiest course to follow, it will leave a very unsightly mess along some of the roads and a bad fire hazard in the very places where fires are most apt to occur.

In view of these various considerations, a continuation of the protection of valuable areas under Plan 2 is recommended by the writer as the most feasible course to follow.

WORKING PLAN FOR FISCAL YEAR 1930

Concentrating the control work on the more valuable and hazardous areas, under Plan 2, will involve the continuous protection of the following units:

Pinnacles Unit (along the Sand Creek Road from the East Entrance to Kerr Notch on the west side of Sand Creek only)
Upper Munson Valley Unit

Anna Spring Unit (including the territory both above and below the ranger station and extending down the South Entrance Road)
Whitehorse Unit (from the upper end of Castle Creek to the West Entrance)

For 1930 the work on these units will involve the treating of about 3,500 trees at a cost of approximately $5,000.

This amount of work can be handled by a camp composed of one spotting crew and three treating crews, working for a period of thirty days. Probably the period from June 1 to 30, 1930, will be the most favorable time to undertake the clean-up.

Two camp locations will be necessary, one at Anna Spring and one at the East Entrance, but the work at both locations can be handled by the same crew.

It might be advisable to try some work this fall. Spotting the infested trees is much more difficult in the fall than in the spring and it is doubtful if all the infested trees can be found. However, working conditions during September are so much better than in the spring that it may pay to do as much felling now as possible. Trees cut in the fall should be left until spring and rolled late in the season. At that time, when the crew returns to roll the logs, missed trees could be located and treated. Fall work followed by a spring clean-up may prove to be the most economical method of handling the treating work, as early spring work is extremely difficult. Fall felling would also avoid the high stumps, which have to be cut twice in the spring, once during the treating work and again later after the snow has gone.

Crater Lake Park is now well equipped with tools and experienced men to handle efficiently the beetle control work. At present they have a balance of about $2,500 in their insect control fund. This is sufficient to handle the clean-up work in the units adjacent to Anna Spring. Another $2,500 is needed to complete the work recommended for the 1930 season in the Pinnacles Unit at the East Entrance and the extension of the work in the Whitehorse Unit. It is hoped that this amount can be secured, as it represents the minimum protection which the Park can afford to give to these recreational and hazardous areas.